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# Environmental Health and Hispanic Children

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There are numerous indicators that Hispanics face a disproportionate risk of exposure to environmental hazards. Ambient air pollution, worker exposure to chemicals, indoor air pollution, and drinking water quality are among the top four threats to human health and are all areas in which indicators point to elevated risk for Hispanic populations. These data, juxtaposed with data on the health status of Hispanics, tell us that the environmental health status of Hispanics and their children is poor. At the same time, significant inadequacies in the collection of data on Hispanics make it difficult to make improving Hispanic environmental health status a priority. These inadequacies include the failure to use Hispanic identifiers in data collection and failure to collect sample sizes large enough to allow for breakouts of data by Hispanic subgroup. In addressing environmental justice issues, the U. S. Environmental Protection Agency (U.S. EPA) and the Department of Health and Human Services (DHHS) should prioritize improving the quantifiability of environmental exposures and risk based on race or ethnicity. However, improving data should not be the prerequisite to significant, affirmative steps by DHHS and U.S. EPA to address environmental and environmental health problems facing Hispanic communities. In particular, a health-based approach to environmental justice should be the priority. — *Environ Health Perspect* 103(Suppl 6):25–32 (1995)

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## Introduction

The Children's Environmental Health Network (CEHN) Symposium, Preventing Child Exposures to Environmental Hazards was a public health milestone because it recognized that for purposes of environmental health the issues of children are different. This is the starting point for CEHN's development of a research and policy agenda to address hazardous environmental exposures to children. The National Coalition of Hispanic Health and Human Services Organization's (COSSMHO) objective in helping to provide an environmental justice context for this landmark symposium is to ensure that the research and policy agenda that results is meaningful for all children, including Hispanic children.

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The National Coalition of Hispanic Health and Human Services Organizations (COSSMHO) is a private, nonprofit, membership organization dedicated to improving the health and well-being of the nation's Hispanic population. Founded in 1973, COSSMHO is the only national Hispanic organization focused on health. COSSMHO pursues its mission through policy and research activities and programming in partnership with community-based member organizations. COSSMHO does not accept funds from alcohol or tobacco companies or their subsidiaries or parent companies.

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A persistent theme underlying most discussions of environmental health is the issue of causation. The difficulty of establishing causation is rooted in the fact that ...the amount of exposure sustained by study subjects and the conditions under which that exposure occurs generally are beyond the direct control of the investigator. Human populations are exposed to multiple pollutants whose individual, let alone joint, effects are not known. Under these conditions, inaccurate measurement of exposure and the effects of extraneous factors on disease occurrence often present major threats to study validity. (1)

Further, such research may set inappropriate toxicity levels for Hispanics and Asians, given recent data that show significantly different pharmacokinetic responses to drugs in drug trials compared to responses in non-Hispanic whites (2). These can be taken as an indication of variable responses to substances in the environment based on ethnicity. Thus, although causality is an important issue, complete research in this area must account for variation in response based on ethnicity and other biologic factors.

The extreme difficulty of not only establishing causation but also accounting for variable responses based on ethnicity underscores the futility and impracticality of approaches to environmental health that are predicated on proof of harm. While research into causation is critical, preservation and improvement of public health necessarily require a protective approach to environmental regulation—one that seeks

to prevent exposure to potentially harmful substances even without certainty of cause. Further, data are available from which sound indications of risk can be determined for various populations. These indicators should be the basis for federal, state, and private efforts to achieve more equitable environmental protection for all people living in the United States, including Hispanics who constitute a major segment of the population.

## Demographics: Hispanic Children

Hispanics constitute a significant portion of the American population—about 22.4 million persons in the United States (3), and an additional 3.5 million persons in Puerto Rico (3). Hispanics are also a youthful population, with a median age of only 26.1 years compared to 27.7 for blacks and 33.6 for whites (4). High birth and fertility rates characterize Hispanics in the United States; they had a birth rate of 26.2 per 1000 persons in 1989, compared to an overall birth rate of 16.3 per 1000 for the United States in general (5). Additionally, the “estimated fertility rate for U.S. Hispanic women aged 15 to 44 years was 104.9, 60% above the rate of 65.7 for non-Hispanic women” (5). These high rates, together with the relative youth of the Hispanic population, have led to projections that by 2010 Hispanics will number 31 million persons (6). Additionally, the 1990 Census of Population and Housing reveals that 29.5% of the Hispanic population was 14 years of age and under, compared to 20.8% of the



non-Hispanic population (3). Indeed, in the same year, "63% of Hispanic families had children under 18 living with the family, compared to 47% for non-Hispanic families" (3). The characteristics of high birth and fertility rates together with youthfulness result in a substantial proportion of the Hispanic population being composed of children. Unfortunately, relatively little is specifically known about the environmental health status of Hispanic children because of a lack of data.

## Key Overall Findings

### Inadequate Data Collection Systems

Overall, since the direction of policy efforts and programs to address serious problems are at least in part driven by data, the lack of data that would be useful in assessing with specificity the environmental health status of Hispanic children remains an important issue for Hispanic communities. The Clinton Administration's 11 February 1994 Executive Order on environmental justice may prove useful in helping to address the issue of data collection on Hispanics. While the provisions of the executive order are peppered throughout the text with the caveat "whenever practicable and appropriate," a notable exception is the provision that requires federal agencies to "provide minority populations and low-income populations the opportunity to comment on the development and design of research strategies undertaken pursuant to this order" (7). At present it is still unclear which studies will be designated as undertaken pursuant to the executive order, and therefore fall under this definition. Nevertheless, this is a potentially important precedent, particularly so for Hispanic communities. To date, Hispanics continue to be regularly excluded from important federal research and data collection activities through methodologies that fail to require ethnic identifiers, do not oversample, do not collect samples of a size sufficient to allow break out by Hispanic subgroup, or rely on interviews conducted by field researchers without the appropriate linguistic competence.

These data collection issues are well documented. The most recent General Accounting Office study on Hispanic access to health care reports that while there are "sources of data that do provide some useful information on the health status of the Hispanic population...no existing database currently provides accurate, complete, and available data on the entire

Hispanic population, including subgroups, residing in the United States" (8). Delgado and Estrada state the problem more specifically, noting that the U.S. Department of Health and Human Services (DHHS) has 21 national health data collection systems which:

...largely form the basis of our quantitative knowledge of public health in the United States.... Of the 21 systems, 6 do not collect Hispanic population data, including the Medicare statistical system. Furthermore, of these data systems, only the National Vital Statistics System collects data for all Hispanic subpopulation groups. Seventeen of the 21 data systems do not collect samples of a size adequate for analysis for any of the four major Hispanic subpopulation groups. (9)

While the Office of Management and Budget has provided the appropriate standards for federal data collection efforts encompassing race and ethnicity in its Directive No. 15 (10), the exclusion of Hispanics from critical national data systems has persisted. Until changes occur in federal data collection and reporting, the information needed to determine the environmental health status of Hispanic children with specificity will continue to elude policy makers, and Hispanic children will continue to be the victims of inequitable federal responses to health and environmental health problems. An excellent case study of the importance of sound data to establishing risk is provided by the recent attention focused on the siting of hazardous waste treatment, storage, and disposal facilities (TSDFs).

### Unfair Siting and Unequal Enforcement

Various studies have sought to document that TSDFs are disproportionately located in black and Hispanic communities. Research conducted by Public Data Access, Inc. for the United Church of Christ Commission on Racial Justice (UCCCRJ), which used ZIP code areas as the primary geographic unit, found that race and ethnicity are the strongest predictors of commercial hazardous waste activity (11). While this study would benefit from analysis that breaks out the specific figures for Hispanics and blacks and has been criticized for using a too large primary geographic area for its computations, it is the first widely recognized attempt to document that a disproportionate number of

TSDFs are located in Hispanic and black communities. Further, substantial anecdotal evidence from COSSMHO member agencies and others in the southwestern United States supports the notion that TSDFs and other sources of risk such as chemical plants, refineries, and other industrial operations pose threats to the health and well-being of Hispanics living near them.

The issues of the disproportionate siting of TSDFs and other operations in Hispanic and black communities are of particular concern because of potential effects on health to those living in the areas surrounding such facilities. For example, various studies have documented serious negative health effects among workers at hazardous waste incinerators (12), which suggests the possibility of similar effects on persons living in the surrounding area. Further, there is compelling evidence that regulatory agencies such as the U.S. Environmental Protection Agency (U.S. EPA), whether intentionally or unintentionally, enforce environmental law differently in Hispanic and black communities. The strongest analysis of this to date was offered by *The National Law Journal*, a Washington-based weekly periodical. Among its findings were that penalties issued pursuant to U.S. hazardous waste laws at sites "having the greatest white population were about 500% higher than penalties at sites with the greatest minority population" (13). The study also found numerous other disparities that suggest unequal protection for Hispanics and blacks under the various environmental statutes. Environmental justice advocates have found this evidence to be less than compelling among those who argue that, with regard to the siting process, economics is the principle determinant of likelihood to live near a TSDF. The argument over economics and market forces does not answer the issue of differential enforcement, however. Rather than becoming entangled in formalistic arguments regarding the role of economics in propensity to live near a TSDF, it is important to remember that the principle reason siting is of concern is because of potentially deleterious effects on health. To this end, the broader categories of concern articulated by this article provide a health-based approach to environmental justice that relies on scientifically established areas of top concern for public health.



### Top High-Risk Human Exposures: Threats to Hispanic Health

In 1987 and again in 1990, the U.S. EPA convened its Science Advisory Board (SAB) to determine the top environmental threats to human health. The 1987 U. S. EPA SAB considered four major types of risk—cancer risks, noncancer health risks, ecological effects, and welfare effects—in an evaluation of 31 environmental problems based on both quantitative data and expert judgment (14). The results of the evaluation included an U.S. EPA ranking of environmental hazards on the basis of cancer risk, as follows: *a*) radon/worker exposure to chemicals; *b*) pesticide residue on food; *c*) indoor air pollutants other than radon/consumer exposure to chemicals; *d*) hazardous/toxic air pollutants; *e*) depletion of stratospheric ozone; *f*) hazardous waste sites—inactive; *g*) drinking water; and *h*) application of pesticides (14). More recently, in 1990 the U.S. EPA SAB's Relative Risk Reduction Strategies Committee released a report which, while not ranking risk from highest to lowest, identified more generally the highest-risk environmental exposures for humans. This listing substantially overlapped with the ranking of risk developed by the U.S. EPA in 1987. The top four high-risk human exposures are:

- ambient air pollutions
- worker exposure to chemicals in industry and agriculture
- pollution indoors
- pollutants in drinking water (15).

These two separate determinations by the U.S. EPA of the top threats to human health are important because they provide expert criteria by which to set environmental policy-making priorities to protect the public health, including the environmental justice issues that are part of these critical public health questions. Further examination of each of the high-risk exposure areas reveals that, in terms of risk, Hispanics either fare the worst or face significant threats to health for every area identified by the U.S. EPA as a top threat to human health.

**U. S. EPA High-risk Human Exposure: Air Pollutions.** Acute effects of air pollution on the respiratory system include "triggering or aggravating of asthmatic attacks, exacerbation of symptoms of chronic obstructive disease, increased upper or lower respiratory infections, transient changes in pulmonary function, increased respiratory symptom reporting, increased respiratory hospital admissions or doctor visits, and

increased daily mortality" (16). Chronic effects of air pollution on the respiratory system include "promotion of the development of asthma, increase in non-specific airway responsiveness, reduced level of lung function, increased rate of lung function decline, decreased rate of lung growth, development of chronic obstructive pulmonary diseases, increased reporting of persistent respiratory symptoms, lung cancer, and increased mortality" (16).

The chronic and acute health effects of exposure to air pollution are in large part responsible for introduction of air pollution control laws in the United States. The Clean Air Act (CAA) (18), which "establishes comprehensive sets of measures to control outdoor air pollution throughout the nation" (17), is the modern mechanism for national regulation of air quality by the U.S. EPA. To control the amount of pollution in the air, the U.S. EPA sets National Ambient Air Quality Standards (NAAQS)—uniform, national air quality standards that restrict ambient levels of certain pollutants to protect the public health (17). According to §108(a)(2) of the CAA (18), these NAAQS must "accurately reflect the latest scientific knowledge useful in indicating the kind and extent of all identifiable effects on public health or welfare which may be expected from the presence of such pollutant in the ambient air." NAAQS exist for particulate matter (which includes emissions from sources such as incinerators), lead, ozone, carbon monoxide, nitrogen oxide, and sulfur dioxide (17).

Unfortunately, Hispanics appear to face elevated risk for developing acute and chronic responses to exposure to air pollution because a disproportionate number of Hispanics live in areas failing to meet one or more NAAQS. Recent research reveals that 80% of Hispanics live in an area failing to meet one U.S. EPA air quality standard compared to 65% of blacks and 57% of whites (19). Additionally, in areas failing to meet two NAAQS, three NAAQS, and four or more NAAQS, Hispanics are consistently significantly worse off as measured by percentage of the population living in these nonattainment areas. Sixty percent of Hispanics, 50% of blacks, and 33% of whites live in areas failing to meet two or more NAAQS; 31% of Hispanics, 20% of blacks, and 12% of whites live in areas failing to meet three or more NAAQS; and finally, 15% of Hispanics, 10% of blacks, and 5% of whites live in areas failing to meet four or more NAAQS (19).

There are some specific data on health outcomes related to air pollution that are consistent with the acute and chronic health effects from exposure to air pollution. The American Lung Association reports that "63% of preadolescent children reside in counties classified as nonattainment for one or more NAAQS" (20). Further, "61% of pediatric asthma cases (less than 18 years of age) are among children living in nonattainment areas for one or more NAAQS" (20). With the exception of regional data on asthma among Puerto Rican children, who are more than three times as likely as non-Hispanic white children to suffer from active asthma (21), specific quantitative knowledge on the environmental health status of Hispanic children is virtually nonexistent. This is largely due to the failure to collect Hispanic specific data in national data systems, also noted above. Nevertheless, on a pollutant by pollutant basis, reviewing data that indicate disproportionate risk for Hispanics provides an indication of the type of health effects Hispanics must therefore be at some degree of elevated risk of experiencing.

**Particulate Matter.** Hispanics are more than twice as likely as either blacks or whites to live in areas with elevated levels of particulate matter. Thirty-four percent of Hispanics, 16.5% of blacks, and 14.7% of whites live in a U. S. EPA nonattainment area for particulate matter (19). Research into the effect of exposure to particulate matter on lung function reveals that both forced vital capacity and forced expiratory volume are consistently lower in urban children than in suburban children (22), strongly suggesting that urban ambient air pollution exposure (particulate matter, NO<sub>2</sub>, SO<sub>2</sub>, etc.) are responsible for the retardation in growth of lung function in children. Research conducted by Joel Schwartz of the Harvard School of Public Health reports an association between elevated levels of PM and death rates for various conditions which have respiratory factors as contributing to the underlying causes of death (23).

**Lead.** Hispanics are more than twice as likely as either blacks or whites to live in areas with high levels of lead. About 18.5% of Hispanics, 9.2% of blacks, and 6% of whites live in a U.S. EPA nonattainment area for lead (19). The effects of lead on child development are well documented and well known. Indeed, "chronic low-level exposure to lead has been linked to damage to the central and peripheral nervous system, low birth weight, learning



disabilities, chronic anemia, shorter stature, impaired hearing, and impaired formation and function of blood cells in young children, infants, and fetuses" (24).

**Ozone.** Hispanics are most likely to live in a U.S. EPA nonattainment area for ozone. Seventy-one percent of Hispanics, 62% of blacks, and 52% of whites live in areas with high levels of ozone (19). "There are some provocative indications that there may be substantial adverse effects [to ozone exposure]. The indications include: greater rate of loss of lung function in nonsmoking men and women..., reduced baseline lung function when annual average O<sub>3</sub> concentration is greater than 40 ppb, based on a national population sample, and an unexpectedly high incidence of centriacinar region disease in the lungs of adolescents and young adults examined postmortem in Los Angeles County" (25). Additionally, "acute reduction of pulmonary function performance following ozone exposure has been documented in epidemiologic studies in which small groups were followed over a short period" (26).

**Carbon Monoxide.** Eighty-eight percent of Hispanics and 85% of non-Hispanic blacks live in nonattainment areas for carbon monoxide, compared to 50% of non-Hispanic whites (19).

Carbon monoxide binds with hemoglobin in the blood to form carboxyhemoglobin (COHb), reducing oxygen transport to the tissues. The most common symptoms of carbon monoxide poisoning are headache, dizziness, drowsiness, nausea, and vomiting. But it can also lead to confusion, neurologic damage, cardiac arrhythmias, coma, and death. Retinal hemorrhages are standard signs of CO poisoning. (19)

### **U.S. EPA High-risk Human Exposure: Worker Exposure to Chemicals in Industry and Agriculture**

Environmental exposure of humans to agrichemicals is common and results in both acute and chronic health effects, including acute and chronic neurotoxicity (insecticides, fungicides, fumigants), lung damage (paraquat), chemical burns (anhydrous ammonia), and infant methemoglobinemia (nitrate in groundwater). A variety of cancers also have been linked to exposure to various pesticides, particularly hematopoietic cancers. Immunologic

abnormalities and adverse reproductive and developmental effects due to pesticides have also been reported (27).

The willingness to continue current pesticide use practice is astonishing given the risk to farm workers and their children. Research reveals evidence of a possible association between pesticide exposure and aplastic anemia (28), while another study on couples seeking artificial insemination with donor sperm because of poor sperm quality found a significant association between male factor infertility and employment in agricultural occupations (29). Still other research suggests elevated risks of Ewing's bone sarcoma for children "whose fathers were engaged in agricultural occupations" (30). Additionally, "[a]n increased risk for anencephaly has been related to parental occupation of farmer and farm worker; neural tube defects, and a combined category of neural tube defects, facial clefts, and renal agenesis have been related to exposure to agricultural chemicals during preconception" (30). There is also evidence to suggest an association between spontaneous abortion and stillbirth and exposure to pesticides (30).

The threat to health indicated by the studies cited above is borne out by 1992 data from the Bureau of Labor Statistics, which indicate that farmworkers account for 11% of all occupational fatalities—the second highest percentage of work-related deaths in the United States after transportation occupations (31). Other data indicate that prolonged exposure to pesticides causes an estimated 313,000 illnesses and 1000 deaths annually among agricultural workers (32). These findings are of particular concern to Hispanic health advocates because Hispanics account for such an overwhelming percentage of both seasonal agricultural workers and migrant workers, and because "[a]griculture accounts for 80% of the 1 billion pounds of pesticides used annually in the U.S." (33). Fully 71% of all seasonal agricultural workers are Hispanic, compared to whites at 23% and blacks at 3% (34). The proportion of Hispanics who are migrant agricultural workers is even higher at 95% (35). Agricultural workers are thus particularly at risk of exposure to pesticides. More specifically, workers who mix, load, and apply pesticides, and workers who are in contact with crops or commodities sprayed with pesticides have the greatest potential exposures (33). In addition, many migrant

farm workers live near the crops they service, and may be regularly exposed to a great variety of pesticides due to pesticide drift and off-gassing (36).

Although regular exposure is foreseeable, of the approximately 600 "active pesticide ingredients" in use "adequate toxicologic data are available" for only about 100 of them (27). Thus even though, "...the effects of acute exposure (usually a relatively large single exposure) are well documented, the effects of chronic, low-level exposure...to pesticides is unclear" (24). Research "is needed to better characterize and quantitate the adverse effects of agrichemicals on human health" (27), yet there is more than enough evidence to justify proactive efforts to prevent harmful exposures to pesticides among farmworkers in terms of which pesticides are registered for use and the aggressive promotion of alternative pest-control technologies.

### **U.S. EPA High-risk Human Exposure: Pollution Indoors**

At first glance pollution indoors appears to be an inconsequential threat to health compared to other exposures, but it can be just as deadly. Among the most serious indoor air quality issues are environmental tobacco smoke and radon. The dangers to health posed by the indoor air pollutants environmental tobacco smoke (ETS) and radon are distinct from many other environmental threats to health in that they are most directly caused by preventable consumer behavior, as in the case of ETS, or randomly occurring natural phenomenon, as in the case of radon.

**Environmental Tobacco Smoke.** It is well established that cigarette smoking is a major cause of death and disease. According to the DHHS,

...[t]obacco use is responsible for more than one of every six deaths in the United States and is the most important single preventable cause of death and disease in our society. Cigarette smoking accounts for about 434,000 deaths yearly including 21% of all coronary heart disease deaths, 87% of all lung cancer deaths, and 82% of all deaths from chronic obstructive pulmonary disease. (36)

The threat to health from tobacco use is not limited to the user of the tobacco product. Others who are near a smoker can be exposed to passive smoke, ETS (37). ETS is "composed of exhaled mainstream smoke (MS) from the smoker, sidestream



smoke (SS) emitted from the smoldering tobacco between puffs, contaminants emitted into the air during the puff, and contaminants that diffuse through the cigarette paper and mouth between puffs" (37). While ETS is dilute compared to MS, it is similar in composition (37). Compounds present in ETS include: 1,3-butadiene, acetic acid, acetone, ammonia, benzene, carbon monoxide, carbon dioxide, formaldehyde, formic acid, hydrogen cyanide, toluene, and various types of particulate matter, including di- and polycyclic aromatic hydrocarbons (37). ETS contains "many of the same carcinogenic and toxic agents" (37) present in MS, and as such ETS poses a significant threat to the health of nonsmokers occupying the same environment.

Consistent with this threat to health the U.S. EPA in 1992 designated ETS as a known human lung carcinogen, or "Group A" carcinogen under U. S. EPA's carcinogen classification system (37). The Group A designation is used "when there is sufficient evidence from epidemiologic studies to support a causal association between exposure to the agents and cancer (37). The application of stringent criteria led to conservative estimates by U.S. EPA that ETS causes approximately 53,000 deaths annually among nonsmokers in the United States, including 3000 lung cancer deaths (38).

The U.S. EPA's designation of ETS as a Group A carcinogen is amplified by the noncancer health effects of exposure to ETS. A positive link has been established between ETS and respiratory illness in children (37), with numerous epidemiological studies demonstrating a causal association between ETS and

- bronchial hyperresponsiveness
- "additional episodes and increased severity of asthma in children who already have the disease"
- reduced lung function as measured by various airflow parameters such as forced expiratory volume
- cough, phlegm, and wheezing (37).

Other studies on the noncancer health effects of ETS on children show evidence of an association between ETS and

- acute lower respiratory tract illnesses such as bronchitis and pneumonia (occurring up to twice as often during the first 2 years of life in the children of smokers)
- acute upper respiratory tract illnesses, acute middle ear infections, and acute middle ear effusion ("the most common

reason for hospitalization of young children for an operation")

- sudden infant death syndrome (SIDS) (37).

Hispanic children are regularly exposed to ETS. According to the National Center for Health Statistics, 44.3% of Hispanic preschool children have been exposed to tobacco smoke compared to 50.8% of non-Hispanic white children (21). Of this substantial number, Hispanic children are more likely to be exposed to tobacco smoke postnatally rather than prenatally. Of all Hispanic children exposed to tobacco smoke, 23.5% have been exposed postnatally compared to 20.9% of non-Hispanics (21). This distinction is important because it indicates a significant deterioration in the quality of Hispanic children's environment once they are born, and points to a need for postnatal health education and intervention in Hispanic households with children.

#### **Radon**

Radon gas is derived from the radioactive decay of radium, a ubiquitous element found in rock and soil. The decay series begins with uranium-238 and goes through four intermediates to form radium-226.... Radium-226 then decays to form radon-222 gas. Radon's half-life, 3.8 days, provides sufficient time for it to diffuse through soil and into homes, where further disintegration produces more chemically and radiologically active radon progeny ('radon daughters'). These radon progeny, which include four isotopes with half-lives of less than 30 minutes, are the major source of human exposure to alpha radiation. This alpha radiation is responsible for cellular transformation in the respiratory tract, which results in radon-induced lung cancer. (39)

While the probability that radon will be a problem is essentially random, public awareness is largely the result of purposive public health education campaigns. Difficulties in raising public awareness about the seriousness of the threat to health posed by radon are centered largely on the fact that radon is colorless, odorless, and tasteless and causes no immediate symptoms. Further, where federal efforts at public education have succeeded for non-Hispanic whites, this is far less true for Hispanics. DHHS's National Center for Health Statistics reports that 61.2% of Hispanics have never heard of radon

compared to 21.5% of whites (40). Public education materials and programs targeting Hispanic communities are critical to reducing this knowledge gap.

**U.S. EPA High-risk Human Exposure: Pollutants in Drinking Water.** The importance of safe drinking water cannot be overemphasized, particularly for children. In a recent poll of public health officials, 82% responded that safe drinking water was the most important or a very important factor in increasing life expectancy and quality of life (41). Hispanic children nevertheless face significant threats to their well-being from tainted water.

**Lead.** In urban areas, drinking water treatment and delivery systems (pipes) can be a source of contamination of water with lead, disinfectants and their by-products, and fluoride (42). Lead in particular may be problematic for urban Hispanic communities as lower income Hispanics are more likely to rent older homes or apartments, which may contain antiquated lead plumbing. This is particularly a source of concern regarding the health of Hispanic infants, as "U.S. EPA found that more than 85% of the blood lead in bottle-fed infants may derive from drinking baby formula made with lead-contaminated water" (43). Further, this concern is corroborated by findings regarding lead-based paint and higher prevalence of elevated blood-lead levels among inner-city children living in deteriorating pre-1970s housing (44). Chronic low-level exposure to lead has been linked to damage to the central and peripheral nervous system, low-birth weight, learning disabilities, chronic anemia, shorter stature, impaired hearing, and impaired formation and function of blood cells in young children, infants, and fetuses (24).

**United States-Mexico Border.** Contamination of the air and water has also been a persistent problem along the United States-Mexico border, leading many public health professionals and others who live and work in the region to believe that contaminated air and water are responsible for a cluster of neural tube defects (NTDs) discovered in 1989 by the Brownsville, Texas, Community Health Center. While the results of a Texas Department of Health study on the cause of NTDs in Cameron County pointed to folic acid supplements for the diets of expectant mothers as a critical prevention measure, the report was inconclusive as to whether or not environmental factors are



responsible for the high incidence of NTDs (45). Thus, "it is important to realize that although there are no overwhelming data to support a role for environmental agents in the etiology of NTDs, there are data that suggest that extrinsic agents need to be evaluated further" (LE Sever, unpublished data). Unfortunately, "[e]nvironmental data collection, particularly on a county-wide level, are not designed to address specialized public health issues such as the elevated rates of NTDs in Cameron County" (45). In addition, data on surface water quality of the Rio Grande are limited, although it is known that mercury concentrations exceeded state standards and guidelines (45), and polychlorinated biphenyls were detected above recommended guidelines in a fish tissue sample collected from the Rio Grande River in Cameron County (45).

Another serious problem for Hispanic children in the United States-Mexico border area is persistent biological contamination of water supplies for residents of United States *colonias*. Most *colonias* originated in the early 1950s when developers began creating subdivisions outside city boundaries. These subdivisions were not incorporated or part of the cities near which they were located (46), and those who moved into them, mostly Mexican-Americans, have lived there since the subdivisions were created (46). Additionally, most *colonias* exist in Texas, although some can be found in New Mexico and Arizona with a substantial number of people (46). In six Texas counties there are about 842 separate *colonias* with over 200,000 persons living in them. Of this only three, or less than 1%, have public sewage disposal systems (46). Without sewage treatment facilities, water supplies often become contaminated with bacteria and viruses (22), which in turn indicate the possible presence of organisms that cause typhoid, cholera, infectious hepatitis, and dysentery (47). Indeed, the *EPA Journal* has reported that "[o]utbreaks of dysentery and hepatitis A are commonplace in the *colonias*, even though in the rest of the United States these severe waterborne afflictions are considered Third World diseases" (47).

**Migrant Labor Camps.** Many of the same Hispanics who face threats to their health such as those described above must also contend with biological and chemical contamination of water supplies at migrant labor camps. Again, specific quantitative measures of this problem are generally unavailable. There are, however, examples

that can be considered reflective of the situation in other sites. For example, a 1992 Pullman Health Systems study found that 43% of water supplies at state-licensed migrant worker camps in nine Michigan counties contained nitrates. In some wells, the levels were so high that federally mandated warnings had to be posted.... (48). Similarly, "[m]igrant labor camps in California covered by the Clean Water Act have been cited by the U.S. EPA for failure to sufficiently sample water provided to laborers for contaminants. Some were exceeding limits for coliform bacteria and some for high levels of nitrates in the water" (49). Based on verifiable anecdotal accounts and other evidence it is anticipated that serious drinking water quality problems are a persistent aspect of migrant labor life.

## Recommendations

Overall, the U.S. EPA needs to make itself accountable to the communities it ultimately serves by improving its responsiveness to community concerns and its accessibility to those concerned about environmental health. For example, for Hispanics, one part of making U.S. EPA accountable must mean increasing the diversity of its staff. Hispanics are severely underrepresented at the U.S. EPA, accounting for only 4% of the total U.S. EPA workforce. This underrepresentation exacerbates the inaccessibility of the agency and its information to interested individuals, community-based organizations (CBOs), and national organizations who represent CBOs and Hispanic communities. Effectively addressing the underrepresentation of Hispanics at the U.S. EPA will involve improved agency responsiveness to Hispanic concerns through immediate, more aggressive efforts to recruit Hispanics for professional positions at U.S. EPA. In addition, it will also require the implementation of long-term strategies to increase the accessibility of the U.S. EPA to Hispanics and to increase the pool of qualified Hispanics from which the U.S. EPA and other federal entities may draw. To this end, U.S. EPA, foundations, and corporations should fund community-based programming that targets Hispanic youth and seeks to cultivate interest in the environment and environmental protection.

The following, more specific, recommendations are similar, made with an eye toward making the federal government accountable to the communities it ultimately serves.

## Data Collection

As the U.S. EPA begins to collect exposure and other population data, it should require methodologies that include ethnic identifiers, conduct oversampling, collect samples of a size sufficient to allow break-out by Hispanic subgroup, and require linguistic competence for interviewers. At minimum both the U.S. EPA and DHHS should adhere to OMB Directive No. 15, which sets forth the minimum standards on data collection activity at federal agencies.

The U.S. EPA should improve the coordinating of its information for public use by identifying and describing all current and proposed data and information collection activities to be funded or to be conducted by the agency. In addition, the U. S. EPA should aggressively pursue policies that promote data sharing and integration.

The U.S. EPA, DHHS, and the Department of Labor should specifically identify which studies each entity will be conducting pursuant to President Clinton's Executive Order on Environmental Justice of 11 February 1994.

## Unfair Siting and Unequal Enforcement

U.S. EPA should fully and completely assess the extent to which particular racial and ethnic groups are more likely to live in proximity to TSDFs, chemical plants, refineries, and other such facilities. This should be done without determining risk or causation.

The U.S. EPA should develop a mechanism for review of local siting processes to ensure full opportunity for participation by local residents and equal protection under U.S. environmental law.

The U.S. EPA should conduct an internal audit of its enforcement activities to determine the extent to which non-Hispanic white communities benefit from more punitive enforcement as compared to Hispanic and black communities.

## Top High-risk Human Exposures: Threats to Hispanic Health

**Ambient Air Pollutions.** Existing NAAQS should be reviewed and modified as needed in light of new research indicating more serious health effects from exposure to ozone and other criteria pollutants. Existing NAAQS may be too lax.

The U.S. EPA should require adherence to state implementation plans under the Clean Air Act with renewed vigor. Noncompliance with NAAQS results in unacceptable health costs for affected



communities and places a particularly onerous burden on children and their development.

Programs targeting Hispanic community-based organizations and individuals for training on how to use the Toxic Release Inventory (TRI) should be a priority to empower Hispanic communities in the monitoring and influence local industry. While the TRI has been a particularly effective tool for non-Hispanic white communities, it remains largely inaccessible to Hispanic communities.

### Worker Exposure to Chemicals in Agriculture

Improving safety of agricultural workers must involve a significant increase in the threshold, which must be met before a pesticide can be registered for use under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). Administrator Carol Browner recently proposed the addition of 313 new chemicals to the Toxic Release Inventory, over 170 of which are currently used and registered as pesticides. That these substances are considered hazardous enough to add to the TRI but at the same time continue to be used for pest control is indicative of a pesticide registration process that does not give appropriate

weight to the health impact on agricultural workers and their children.

The federal government must also improve access to health care for agricultural workers through health reform, and improve monitoring of growers for compliance with farmworker safety standards.

### Indoor Air Pollutants

A tobacco tax should be imposed to reduce smoking behavior while at the same time raising revenue for critical national efforts such as health reform and environmental justice.

Increased public education is necessary, targeted to the specific groups that need to be reached with messages on prevention or mitigation, recognizing that simple translation of materials intended for mainstream, non-Hispanic white audiences or other communities is not effective.

We also need to encourage development of creative programming targeted to Hispanics, which focuses not only on raising awareness and eliciting testing, but also seeks to provide low-cost options for mitigation.

### Drinking Water Quality

The U.S. EPA, OSHA, and relevant state entities must vigorously pursue enforcement

of existing regulations relevant to the working conditions of migrant farmworkers, including availability of clean drinking water. Where gaps exist, new regulations should be initiated through the public review and comment procedure.

The U.S. EPA and DHHS should continue lead abatement programs targeting urban areas, but should improve them by including linguistic and cultural competence as critical elements of program implementation.

The U.S. Trade Representative and the U.S. EPA should undertake a public education campaign targeted to the residents of the United States–Mexico border area to inform them about the public participation provisions of the environmental side accord to the North American Free Trade Agreement (NAFTA). Public participation should be facilitated in all NAFTA related environmental activities.

U.S. EPA, HUD, DHHS, and other relevant governmental entities should make bringing modern water treatment and delivery systems to the *colonias* a priority and they should act on that priority with appropriate funding.

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